Status of the Claims.

The status of the claims follows:

Claim 1. (Currently amended) A filter system for adsorbing contaminants from a molten carbonate fuel cell exhaust stream comprising

a filter substrate coated with a material, wherein the material comprises

an inorganic adsorbent secured to the filter substrate by an inorganic binder, and

an acidic material coated onto the filter substrate, wherein the acidic material comprises an inorganic acid.

Claim 2. (Original) The filter system of Claim 1 wherein the composition of the filter substrate is selected from a group of materials consisting of ceramic, alumina, titania, zirconia, boria, corundum, silica, magnesia, silica-zirconia, titania-zirconia, titania-silica, silica-alumina, silicon carbides, cordierite, mullite, and metallic filters, such as stainless steel, iron chromium alloy and other metallic alloy filters and mixtures and combinations thereof.

Claim 3. (Original) The filter system of Claim 1 wherein the filter substrate comprises a metallic filter.

Claim 4. (Original) The filter system of Claim 1 wherein the inorganic adsorbent is selected from the group consisting of alumina, silica, titania, titania-silica, silica-alumina, zirconia silica-zirconia, ceria, and zeolites, either modified or unmodified.

Claim 5. (Original) The filter system of Claim 1 wherein the inorganic adsorbent comprises a high surface area material selected from the group consisting of alumina, silica, titania, zirconia, ceria, titania-silica, silica-alumina, silica-zirconia and zeolites.

Claim 6. (Original) The filter system of Claim 1 wherein the inorganic adsorbent comprises a high surface area alumina with a surface area greater than about 100 m^2/g.

Claim 7. (Original) The filter system of Claim 1 wherein the inorganic binder for binding the inorganic adsorbent to the filter substrate is selected from the group consisting of sols of alumina, silica, zirconia, ceria, titania, boehmite and aluminum nitrate, and blends of two or more different binders.

Claim 8. (Original) The filter system of Claim 1 wherein the filter substrate comprises a stainless steel screen and the inorganic binder comprises ceria.

Claim 9. (Canceled)

Claim 10. (Original) The filter system of Claim 1 wherein the acidic material comprises a non-water soluble inorganic acid.

Claim 11. (Original) The filter system of Claim 1 wherein the acidic material comprises heteropolyphosphoric acid.

Claim 12. (Original) The filter system of Claim 1 wherein the inorganic adsorbent comprises about 60 to about 95 percent, the inorganic binder comprises about 5 to about 40 percent and the acidic material comprises about 0.1 to about 20 percent of

the material coated on the filter substrate.

Claim 13. (Original) The filter system of Claim 1 wherein the inorganic adsorbent comprises about 80 to about 95 percent, the binder comprises about 1 to about 20 percent and the acidic material comprises about 0.1 to about 5 percent of the material coated on the filter substrate.

Claim 14. (Currently amended) A filter system for adsorbing contaminants from an exhaust system from a molten carbonate fuel cell prior to passage of the exhaust stream through an oxidation catalyst comprising

a filter substrate,

a high surface area inorganic adsorbent secured to the filter substrate by an inorganic binder, and

an inorganic acidic material coated onto the filter substrate, wherein the inorganic acidic material comprises an inorganic acid.

Claim 15. (Canceled)

Claim 16. (Canceled)

Claim 17. (Original) A process for filtering contaminants which are present in an exhaust stream of a molten carbonate fuel cell comprising

passing a fuel stream through the molten carbonate fuel cell,

passing at least a portion of an exhaust stream containing inorganic contaminants through a filter system, and

filtering the inorganic contaminants from the exhaust

stream by use of the filter system, wherein the filter system comprises a filter substrate, an inorganic adsorbent secured to the filter substrate by an inorganic binder and an acidic material coated onto the filter substrate.

Claim 18. (Previously presented) The process of Claim 17 further comprising passing at least a portion of the filtered exhaust stream after passage through the filter system through an oxidation catalyst system.

Claim 19. (Original) An exhaust treatment system for adsorbing contaminants from a molten carbonate fuel cell comprising the filter system of Claim 1 and an oxidation catalyst.

Claim 20. (Original) An exhaust treatment system for adsorbing contaminants from a molten carbonate fuel cell comprising the filter system of Claim 14 and an oxidation catalyst.

Claim 21. (Original) A process for filtering contaminants which are present in an exhaust stream of a molten carbonate fuel cell comprising

passing a fuel stream through the molten carbonate fuel cell which generates an exhaust stream containing inorganic contaminants,

passing at least a portion of the exhaust stream containing inorganic contaminants through a filter system,

filtering the inorganic contaminants from the exhaust stream by use of the filter system, wherein the filter system

comprises a filter substrate, an inorganic adsorbent secured to the filter substrate by an inorganic binder and an acidic material coated onto the filter substrate and

passing the filtered exhaust stream through an oxidation catalyst.

Claim 22. (Original) A process for preparing an exhaust treatment system for filtering exhaust gases from a molten carbonate fuel cell comprising

preparing the filter system of Claim 1,

preparing an oxidation catalyst for fuel cells, and

placing the filter system and the oxidation catalyst on-line to filter the exhaust gases from the molten carbonate fuel cell.

Claim 23. (New) A filter system for adsorbing contaminants from a molten carbonate fuel cell exhaust stream consisting essentially of

a filter substrate coated with a material, wherein the material comprises

an inorganic adsorbent secured to the filter substrate by an inorganic binder, and

an acidic material coated onto the filter substrate.

Discussion of Amendments

The applicants have amended Claims 1 and 14 to incorporate into those claims a limitation on the composition of the "acidic material," wherein the acidic material now comprises an "inorganic acid." This limitation was contained in Claim 9, as originally filed. Further support for this limitation is contained on page 15, lines 6 - 7. Because Claim 9 has been incorporated into Claim 1, Claim 9 has been cancelled.

In addition, applicants have added new Claim 23, which corresponds to Claim 1, as originally filed, with the transition language of the claims being "consisting essentially of" rather than "comprises".

No new subject matter is introduced by any of the amendments to the claims or by the introduction of new Claim 23.

Analysis

The United States Patent and Trademark Office rejected Claims 1 - 9, 12 - 14, 19 and 20 under 35 USC § 102(b) as being anticipated by Deeba, et. al., U.S. Patent No. 6,093,378. The USPTO allowed Claims 17, 18 and 21 and indicated that Claims 10, 11 and 22 would be allowable, if amended to included the limitations of the base claim and any intervening claims. The applicants wish to thank the Examiner for the allowance of claims and the indication that additional claims would be allowable, if amended.

The USPTO rejected a number of claims of the application as being anticipated by Deeba, et. al. The applicants respectfully traverse each rejection. The applicants respectfully assert that no person skilled in the art would consider Deeba, et. al. as disclosing the invention, as claimed, because of the vast differences between the composition disclosed by Deeba, et. al. and its use and the composition claimed by the applicants and its use.

The composition disclosed by Deeba, et. al. is a four way diesel exhaust catalyst and method of use. The Deeba, et. al. catalyst requires the following components: a first zeolite, a precious metal loaded second zeolite, and a precious metal component used as a catalyst for the removal of hydrocarbons, carbon monoxide, nitrogen oxide and particulate matters. The first zeolite functions to trap hydrocarbons at low temperature and releases the absorbed hydrocarbons at high temperature.

The first zeolite is used for the cracking of hydrocarbon portions of the particulate matter and for its removal. The precious metal loaded zeolite is present for the reduction of nitrogen oxides.

In contrast, the applicants invention discloses and claims an exhaust filtration system which functions as a passive poison guard for down stream oxidation catalysts for use in a very specific application, i.e., a molten carbonate fuel cell exhaust stream. No person skilled in the art would even consider the disclosure of Deeba, et. al. as disclosing the invention because of the significant difference in components that are required to be present in the composition of Deeba, et. al. including a first zeolite (Col. 10, lines 5 - 30), a second zeolite doped with a precious metal (Col. 10, lines 31 - Col. 12, line 43) and "at least one precious metal component" (Col. 12, line 44 - Col. 13, line 32). None of these components are required or claimed as a component of the composition of the invention. Further, the catalyst composition of Deeba, et. al. is designed for use in a four way diesel exhaust which has nothing to do with a molten carbonate fuel cell. Thus, no person skilled in the art looking for a solution to the problems solved by the applicants' invention would look to the disclosure of Deeba, et. al.

Notwithstanding applicants' view that all claims, as originally filed, are allowable over Deeba, et. al., in order to advance prosecution of the claims and to put the claims in

condition for allowance, the applicants have amended independent Claims 1 and 14 to incorporate the limitation from Claim 9 that the "acidic material" comprises an "inorganic acid."

The USPTO makes two arguments asserting that an "acidic material" is disclosed by Deeba, et. al. Notwithstanding, on page 4, lines 10 - 12 of the Office Action, the Examiner acknowledged that the only acid which is disclosed in Deeba, et. al. is "acetic acid." As is well recognized, acetic acid is an "organic" acid. (See, for example, Kirk-Othmer, "Concise Encyclopedia of Chemical Technology, Fourth Edition" pages 6 -7, a copy of which are attached as **Exhibit A.**) Thus, by amending Claims 1 and 14 to require that the "acidic material" be an inorganic acid, applicants have distinguished this teaching of Deeba, et. al. In addition, the catalyst composition of Deeba, et. al. after processing fails even to contain acetic acid. In the process of Deeba, et. al., at Col. 15, line 27 and in each of the cited examples (Example 1, Col. 18, line 29, Example 3, Col. 19, line 13, Example 4, Col. 19, lines 43 - 44, Example 5, Col. 20, lines 8 -9 and Example 6, Col. 20, lines 36 - 37), the composition, which has been treated with acetic acid, is calcined at a quite high temperature, i.e., 550°C. As a result of this calcination, any acetic acid that was present on the composition is decomposed, and, thus, none is present in the final composition of Deeba, et. al. Accordingly, the final composition of Deeba, et. al.

fails to include any "acidic material."

In addition, the USPTO cites Col. 18, lines 15 - 19 of Deeba, et. al. as disclosing the presence of an inorganic acid in the composition of their product. The applicants respectfully assert that the USPTO's assertion is based on a misunderstanding of the teaching of Deeba, et. al. The applicants assert that the material that is described in this section of Deeba, et. al. is not an "inorganic acid" but rather an "H-Beta Zeolite." An acidic zeolite, as disclosed in the cited portion of Example 1 of Deeba, et. al., is <u>not</u> equivalent to an "inorganic acid." The composition of Deeba, et. al. in Example 1 is produced by exchanging the Na^+ cations of the zeolite with H^+ ions to produce an acidic zeolite. This acidic zeolite is then blended with Pt/Al_2O_3 and Pt/CeO_2 slurries and coated onto the substrate. The coated substrate is then dried at 100°C and calcined at 550°C for 2 hours. After this extreme heat treatment the only "acidic material" that remains is the H-Beta zeolite, which is <u>not</u> an inorganic acid. Any other acidic material is decomposed in the calcination process.

In contrast, the component which is claimed in Claims 1 and 14 of the application is an "inorganic acid," preferably not a water soluble acid and most preferably a heterophosphoric acid or a polyphosphoric acid. No person skilled in the art would equate the H-Beta zeolite of Deeba, et. al. with an "inorganic acid." Accordingly, Deeba, et. al. fail to disclose

the presence of an "inorganic acid" in the composition, as claimed.

As the only acid that is disclosed by Deeba, et. al. is organic and after calcination is not even present on the exhaust catalyst, and as the only acidic material that is now claimed is an inorganic acid, which differs dramatically from H-beta zeolite, the applicants assert that all claims are allowable over Deeba, et. al.

New Claim 23

The applicants have added new Claim 23 containing the same claim limitations as were present in originally filed Claim 1. The difference between Claim 23 and Claim 1, as filed, is that Claim 23 utilizes the transitional language "consisting essentially of" instead of "comprising." The applicants respectfully assert that Claim 23 is also allowable over Deeba, et. al. as the composition disclosed by Deeba, et. al. requires a number of components which are not required by Claim 23. In particular, Deeba, et. al. requires the presence of at least two zeolite components including a second zeolite component comprising a zeolite and a precious metal component. (See Col. 10, lines 38 - 40, each of the Examples and each claim.) In contrast, there is no required zeolite component containing a precious metal component in Claim 23. In addition, Deeba, et. al. requires "at least one first precious metal component in addition to the first and second zeolite component." Col. 11,

lines 65 - 67, Col. 12, lines 44 through Col. 13, line 32 and Col. 14, lines 17 - 30 as well as the Examples and the claims. As neither of these required components of the composition of Deeba, et. al. are elements claimed in Claim 23, the applicants respectfully assert that Claim 23 is allowable over Deeba, et. al.

As further support for the allowability of Claim 23, the only "acidic material" that is described as being added to the composition of Deeba, et. al. is acetic acid. The acetic acid of Deeba, et. al. is used to fix the "catalytically-promoting metal component" on the support. (See Col. 15, lines 13 - 18.) As Claim 23 does not require the presence of a catalytically-promoting metal component, no person skilled in the art would add acetic acid to the composition because there would be no need to fix the non-existent "catalytically-promoting metal component" to the support. In addition as noted above, acidic acid is not even present in the final product as a result of the calcination step.

For all of these reasons, the applicants assert that Claim 23 is also allowable over Deeba, et. al.

Reservation of Rights

The applicants specifically reserve the right to file a divisional or continuation application claiming the same subject matter as originally claimed in Claims 1 and 14 and the dependent claims depending thereon.

CONCLUSION

The applicants requests that all claims, as amended, as well as new Claim 23, be allowed. If there are any questions concerning this Amendment, please contact applicants' counsel.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service in an envelope addressed to Mail Stop Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: August 3, 2004 Holly Hart

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